

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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To:

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/EP2004/010199

International filing date (day/month/year)
13.09.2004

Priority date (day/month/year)
30.09.2003

International Patent Classification (IPC) or both national classification and IPC
H04N1/409, H04N5/217

Applicant
FOTONATION VISION LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2004/010199

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2004/010199

Box No. II Priority

1. ☒ The following document has not been furnished:
- ☒ copy of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(a)).
 - ☐ translation of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(b)).
- Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. ☐ It has not been possible to consider the validity of the priority claim because a copy of the priority document was not available to the ISA at the time that the search was conducted (Rule 17.1). This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.
4. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-130
	No: Claims	
Inventive step (IS)	Yes: Claims	67,83-120
	No: Claims	1-66,68-82,121-130
Industrial applicability (IA)	Yes: Claims	1-130
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:

- D1: US 2002/093577 A1 (ICHIKAWA CHIAKI ET AL) 18 July 2002 (2002-07-18)
- D2: US-A-6 035 072 (READ ROBERT LEE) 7 March 2000 (2000-03-07)
- D3: PATENT ABSTRACTS OF JAPAN vol. 2000, no. 05, 14 September 2000 (2000-09-14) & JP 2000 050062 A (MINOLTA CO LTD), 18 February 2000 (2000-02-18) & US-B1-6 792 161, 14 September 2004 (2004-09-14)

2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1, 2, 4, 18-20 and 82 does not involve an inventive step in the sense of Article 33(3) PCT.

2.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses (the references in parentheses applying to this document):

- a method of automatically correcting dust artifact regions within images acquired by a digital acquisition device including an optical system (par. 2,6), comprising:
 - digitally-acquiring one or more original images with said digital acquisition device (par.30-32; fig.3 steps 32,33);
 - determining probabilities that certain pixels correspond to dust artifact regions within said one or more digitally-acquired images (par.33; fig.3 step 34);
 - associating the dust artifact regions with one or more extracted parameters relating to the optical system when the one or more images were acquired (par.33,; fig.3 step 35);
 - forming a statistical dust map including mapped dust regions based on the dust artifact probability determining and associating (par.35-36; fig.4);
 - correcting pixels corresponding to dust artifact regions ... based on the associated statistical dust map.

The subject-matter of claim 1 differs from the disclosure of D1 in that the corrected pixels are pixels "within each of said one or more original images", whereas in D1 the corrected pixels are pixels of different images (fig.3 steps 38-42).

However, no technical effect is achieved and no problem is solved by this minor

modification. In both cases (D1 and present application) the dust map enables the dust correction of images taken with a particular setting of the optical system of the camera. It is therefore a pure matter of choice without the exercise of inventive skill to either use the dust map for the correction of a different image or the same image.

Claim 1 therefore does not involve an inventive step (Art. 33(3) PCT).

2.2 (Claims 2, 4) Dependent claims 2 and 4 relate to the choice of optical parameters, which have been disclosed by D1 (D1: par.34).

2.3 (Claims 18-20) Processing the image either inside the camera or outside in an external device is a matter of choice without inventive skill.

2.4 (Claim 82) Dust artifact data is sorted according to particular criteria (called meta-data in claim 82) in D1: fig.4.

3. Furthermore, dependent claims 3, 5-17, 21-66, 68-81 and 121-130 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Art. 33(3) PCT).

3.1 (Claims 5-17, 21-32, 34-39, 58-66, 121-130) Dependent claims 5-17, 21-32, 34-39, 58-66 and 121-130 relate to a particular way of determining the probability that a particular pixel is an image of a dust particle.

The problem addressed by these claims can therefore be regarded as how to decide whether a specific pixel under test represents an image of a dust particle or not. With this problem in mind the skilled person would consult document D2 which also deals with the problem of dust detection in imaging applications (D2: col.2 l.8-61).

D2 discloses in detail the subject-matter of the dependent claims mentioned above. It explicitly describes how the dust detection is performed on an arbitrary image which does not have to be a reference image (D2: col.2 l.88-11), the use of thresholds (D2: fig.6 step 640) and how the dust map is updated with further images (D2: col.4 l.37-58).

A skilled person would easily combine D1 with the dust detection algorithm of D2 in order to arrive at the subject-matter of the above-mentioned claims. Therefore, these claims do not involve an inventive step (Art. 33(3) PCT).

3.2 (Claims 3, 33, 40-57, 68-81) Further dependent claims 3, 33, 40-57 and 68-81 relate to a particular appearance of dust particle images and how to calculate certain optical parameters of the system after an analysis of the dust particle image.

The problem addressed by these claims can therefore be regarded as how to relate parameters of the optical system to the appearance of the dust particle image.

A similar problem has been solved by document D3 (reference is made to the US-document claiming a single priority from the JP-document, which is in time). D3 also addresses the problem of dust in optical imaging applications. D3 discloses the detection of positions (distance along optical axis) of a dust particle in an imaging system with a known optical system depending on the appearance of the dust particle image (D3: fig.11). A skilled person would without the exercise of inventive skill apply the teaching of D3 to the present problem and derive parameters of a variable optical system when the position of the dust particle (distance along optical axis) is known, depending on the appearance of the dust particle image.

The above-mentioned claims do therefore not involve an inventive step (Art. 33(3) PCT).

4. (Claims 67, 83-120) As far as dependent claims 67 and 83-120 can be understood, they relate to a specific way of recalculating existing dust maps generated with a particular setting of the optical system to correlate with other images taken with a different setting of the optical system. The advantage appears to be that any image taken with a new setting of the optical system can be dust-corrected using the recalculated, but existing dust map.

It appears that these details have not been disclosed in any of the cited documents and the combination of features of claims 67 or 83-120 with the features of claim 1 is therefore considered novel and inventive.